CLAIMS:

1. Apparatus for distributing ADSL signals to customer premises from a central office, comprising:

a central office having a POTS switching system and ADSL terminals that connect to a data network;

a plurality of customer locations at least some of which have at least one voice frequency POTS terminal and at least one ADSL terminal;

a field cabinet associated with the plurality of customers;

a plurality of individual metallic telephone lines each extending from a respective one of the customers to the field cabinet;

a trunk cable containing a large number of metallic telephone lines and extending from the field cabinet to the central office;

the field cabinet including a plurality of connections for connecting the individual telephone lines to the trunk cable for connection of signals between the customer locations and the central office;

the individual metallic telephone lines each being arranged to transmit both voice frequency POTS signals and ADSL signals between the respective customer location and the field cabinet;

a bi-directional link separate from the trunk cable for the broadband transmission of analog signals in pre-selected frequency bands between the central office and the field cabinet;

a splitter and interface module at the field cabinet having:

a plurality of signal splitting coupler units each associated with a respective one of the individual telephone lines and each arranged to separate the ADSL signals and the voice frequency POTS signals from the respective telephone line;

a plurality of connectors each arranged to connect the separated voice frequency POTS signals between the respective individual telephone line and the trunk cable;

a plurality of interface and frequency translation units each associated with a respective one of the coupler units for receiving the separated ADSL signals from the coupler unit and for communicating the bi-directional ADSL signals on the bi-directional link between the central office and the respective individual telephone line in a pre-selected one or more of the frequency bands that are associated with the respective individual telephone line; and

a plurality of frequency translation and interface units at the telephone central office each of which is associated with the pre-selected band or bands on the bi-directional link associated with a respective individual telephone line and each of which provides an interface between the respective ADSL signals on the bi-directional link and the ADSL terminal of the central office.

2. The apparatus according to Claim 1 wherein the signal splitting coupler includes a filter that couples to the connectors substantially only voice frequency signals in the frequency band below 4 kHz and couples to the interface and frequency translation units substantially only signals in the frequency range above 20 kHz.

3. The apparatus according to Claim 1 wherein the bi-directional link includes a fiber optic link between the field cabinet and the central office, an optical transceiver at the field cabinet and a second optical transceiver at the central office.

4. The apparatus according to Claim 3 wherein the fiber optic link includes two unidirectional fiber optic links and wherein the interface and frequency translation units each contain a directional hybrid coupler to interface the bi-directional metallic telephone line to the unidirectional fiber optic link.

5. The apparatus according to Claim 3 wherein the fiber optic link includes a fiber optic cable and a metallic conductor pair for supplying power from the central office to the interface and frequency translation units.

6. The apparatus according to Claim 1 wherein the frequency translators are arranged such that the frequency bands are each located within a respective 6 MHz frequency band communicated on the bi-directional link.

7. The apparatus according to Claim 1 wherein each frequency translator from the ADSL signals to the frequency band includes a CATV modulator arranged to locate the respective ADSL signals within a respective video channel frequency band which is then communicated on the bi-directional link.

8. The apparatus according to Claim 7 wherein each frequency translator includes a first translator element arranged to translate to an intermediate frequency by double side band transmitted carrier amplitude modulation (AM-DSB-TC) of a radio frequency carrier at the intermediate frequency and wherein the CATV

modulator is arranged to translate from the intermediate frequency to the respective video channel frequency band.

9. The apparatus according to Claim 8 wherein the first translator element is arranged to effect direct translation from the ADSL signals to the pre-selected frequency band by AM-DSB-TC modulation of a radio frequency carrier.

10. The apparatus according to Claim 8 wherein each frequency translator includes a first tuner element arranged to translate from the pre-selected frequency band to the intermediate frequency band and the tuner to be followed by envelope detection of the AM-DSB-TC signal so as to translate the signal from the intermediate frequency band to the ADSL signal band on the metallic telephone line.

11. The apparatus according to Claim 1 wherein the bi-directional link includes a coaxial cable link.

12. The apparatus according to Claim 11 wherein the means in each frequency translator communicating the bi-directional ADSL signals via the coaxial cable comprises at least one transmitter and at least one receiver arranged to transmit and receive the bi-directional signals at respective frequencies.

13. The apparatus according to Claim 12 wherein said frequency translator at the telephone central office is tuned to transmit signals at a respective frequency in a first frequency band for a downstream transmission direction on the coaxial cable, and the said frequency translator at field cabinet is tuned to transmit signals at a respective frequency in a second frequency band for an upstream transmission direction on the coaxial cable.

14. A splitter and interface module for use in apparatus for distributing ADSL signals to customer premises from a central office, the apparatus including:

a central office having a POTS switching system and ADSL terminals that connect to a data network;

a plurality of customer locations at least some of which have at least one voice frequency POTS terminal and at least one ADSL terminal;

a field cabinet associated with the plurality of customers;

a plurality of individual metallic telephone lines each extending from a respective one of the customers to the field cabinet;

a trunk cable containing a large number of metallic telephone lines and extending from the field cabinet to the central office;

the field cabinet including a plurality of connections for connecting the individual telephone lines to the trunk cable for connection of signals between the customer locations and the central office;

the individual metallic telephone lines each being arranged to transmit both voice frequency POTS signals and ADSL signals between the respective customer location and the field cabinet;

and a bi-directional link separate from the trunk cable for the broadband transmission of analog signals in pre-selected frequency bands between the central office and the field cabinet;

the splitter and interface module at the field cabinet comprising:

a mounting assembly for mounting on the field cabinet;

a plurality of terminal blocks for connection to the individual telephone lines;

a plurality of signal splitting coupler units each connected to respective connections of the terminal blocks for associated with a respective one of the individual telephone lines and each coupler unit to separate the ADSL signals from the respective individual metallic telephone line;

a plurality of interface and frequency translation units each connected to a respective one of the coupler units for receiving the separated ADSL signals from the coupler unit and for translating the bi-directional ADSL signals to and from a pre-selected one or more of the frequency bands;

and a connector for communicating the ADSL signals in the pre-selected frequency band on the bi-directional link.

15. The module according to Claim 14 including at least one optical transceiver for communicating the ADSL signals on fiber optic cable.

16. The module according to Claim 14 including at least one directional hybrid coupler to interface an associated bi-directional metallic telephone line to unidirectional transmission links between the field cabinet and the CO.

17. The module according to Claim 14 wherein the frequency translators are arranged such that the pre-selected frequency bands are each located within a respective 6 MHz frequency band.

18. The module according to Claim 14 wherein each frequency translator from the ADSL signals to the pre-selected frequency band includes a CATV modulator arranged to locate the respective ADSL signals within a respective

video channel frequency band and wherein each frequency translator from the pre-selected frequency band includes a CATV tuner arranged to translate the ADSL signal from the respective video channel frequency band to the frequency band required for transmission on the individual metallic telephone line.

19. The apparatus according to Claim 18 wherein each frequency translator includes a first translator element arranged to translate to an intermediate frequency by double side band transmitted carrier amplitude modulation (AM-DSB-TC) of a radio frequency carrier at the intermediate frequency and wherein the CATV modulator is arranged to translate from the intermediate frequency to the respective video channel frequency band.

20. The apparatus according to Claim 19 wherein the first translator element is arranged to effect direct translation from the ADSL signals to the pre-selected frequency band by AM-DSB-TC modulation of a radio frequency carrier.

21. The apparatus according to Claim 20 wherein each frequency translator includes a first tuner element arranged to translate from the pre-selected frequency band to the intermediate frequency band and the tuner to be followed by envelope detection of the AM-DSB-TC signal so as to translate the signal from the intermediate frequency band to the ADSL signal band on the metallic telephone line.

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